

Machine translation JP2000032426**(Bibliographic data + Summary + Claim)**

(19)**Publication country**Japan Patent Office (JP)
(12)**Kind of official gazette**Publication of patent applications (A)
(11)**Publication No.**JP,2000-32426,A (P2000-32426A)
(43)**Date of Publication**January 28, Heisei 12 (2000.1.28)
(54)**Title of the Invention**A receiving set of a transport stream
(51)**The 7th edition of International Patent Classification**

H04N 7/16

H04L 12/56

FI

H04N 7/16 Z

H04L 11/20 102 Z

Request for ExaminationUnrequested**The number of claims** 5**Mode of Application**OL**Number of Pages**9(21)**Application number**Japanese Patent Application No. 10-192083(22)**Filing date**July 7, Heisei 10 (1998.7.7)(71)**Applicant****Identification Number**000004075**Name**YAMAHA CORP.**Address**10-1, Nakazawa-cho, Hamamatsu-shi, Shizuoka-ken(72)**Inventor(s)****Name**Fujii Shigeki**Address**10-1, Nakazawa-cho, Hamamatsu-shi, Shizuoka-ken Inside of YAMAHA CORP.(74)**Attorney****Identification Number**100092820**Patent Attorney****Name**Itami ****Theme code (reference)**

5C064

5K030

F-term (reference)

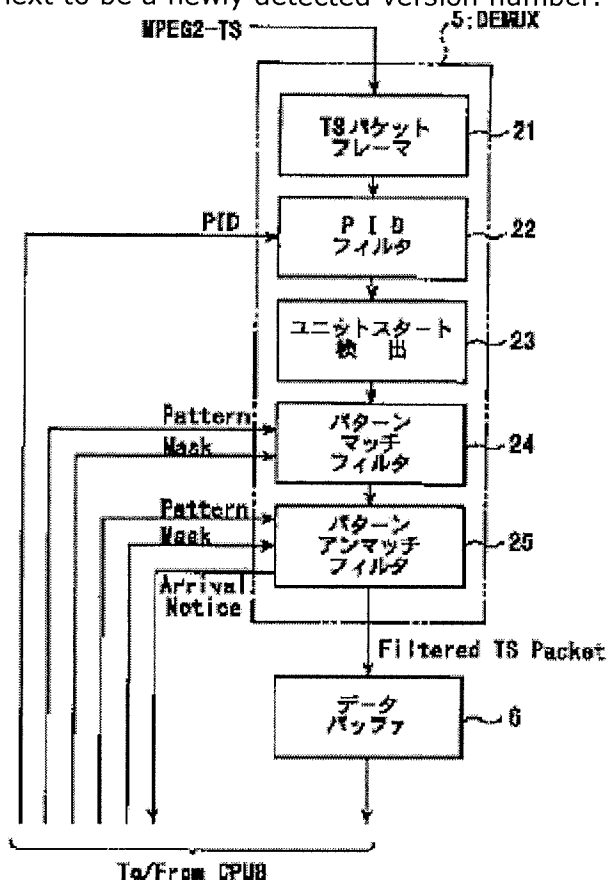
5C064 BA01 BB05 BC10 BC13 BC20 BD08 BD09 BD14

5K030 GA12 HB02 HB28 JA01 JL01 JT04 LD07 MB13

Abstract:

PROBLEM TO BE SOLVED: To realize a stiff TS demultiplex processing, even with respect to a transmission fault or a reception fault. SOLUTION: Even when a version number is revised, the receiver acquires a desired packet that includes an ID to specify whether or not the packet is to be acquired and a version number that is revised from an MPEG2-TS whenever time contents of the packet are revised. In this case, a pattern match filter 24 extracts the packet, when the pattern match filter 24 detects matching of a pattern of the ID from the TS. A pattern unmatching filter 25

extracts the packet, when the filter 25 detects that a version number included in the packet extracted by the filter 24 differs from the version number monitored at present. A CPU8 acquires the packet, when the filter 25 extracts the desired packet and uses the version number monitored next to be a newly detected version number.



JPO Machine translation abstract:

(57) Abstract

SUBJECT Dogged TS demux processing is realized also to send trouble or radio disturbance.

Means for Solution A packet of a request containing a version number changed whenever the contents of ID which specifies from MPEG 2-TS that it is a packet which should be gained, and its packet are changed is gained whenever a version number is changed. The packet will be extracted if pattern coincidence of ID is detected from TS in that case as for the pattern match filter 24. The pattern AMMATCHI filter 25 extracts the packet, when it detects that a version number contained in a packet extracted with the filter 24 differs from a version number under present surveillance. CPU8 gains that packet, when a desired packet is extracted by this filter 25, and it makes a version number supervised next a newly detected version number.

Claim(s)

Claim 1 From a multiplexed transport stream characterized by comprising the following. A receiving set of a transport stream which gains a packet of a request including the 2nd information changed whenever the contents of the 1st information that specifies that it is a packet which should be gained, and the packet concerned are changed whenever said 2nd information is changed. The 1st filter that detects said 1st information from said inputted transport stream, and extracts a packet of said request.

The 2nd filter that extracts a packet extracted with said 1st filter when it detected that said 2nd information included in a packet extracted with this 1st filter differs from the 2nd information under present surveillance.

A control means which updates the 2nd information that the packet concerned is gained when a

desired packet is extracted by this 2nd filter, and is supervised next to the 2nd newly detected information.

Claim 2A receiving set of the transport stream according to claim 1 while a packet of said request is changed **said 2nd information**, wherein it is data by which repeating transmission is carried out by an identical content.

Claim 3A receiving set of the transport stream according to claim 1 or 2, wherein said 1st filter is what extracts the packet concerned when coincidence with the specific matching field and the 1st pattern of said packet which should be gained is detected.

Claim 4A receiving set of a transport stream of claim 1-3, wherein said 2nd filter is what extracts the packet concerned when disagreement of the specific matching field and the 2nd pattern of said packet which should be gained is detected given in any 1 paragraph.

Claim 5A receiving set of a transport stream of claim 1-4, wherein said control means is what gains a packet of said request periodically irrespective of renewal of said 2nd information given in any 1 paragraph.

Detailed Description of the Invention

0001

Field of the Invention This invention, for example like MPEG 2(Moving Picture Experts Group Phase 2)-TS (Transport Stream), It is related with the receiving set of the transport stream which improved especially the adaptability at the time of a fault occurrence about the receiving set which gains a desired packet from the multiplexed transport stream.

0002

Description of the Prior Art In digital data broadcast, as a multiplexed transmission stream, an image and a sound are digitized with the gestalt of MPEG 2-TS and it is sent to a receiver at digital CS broadcasting, for example. At this time, the program related information called program specification information (ProgramSpecific Information:PSI) and servicing information (Service Information:SI) is also simultaneously sent to TS. It was packet-ized by 188 bytes of fixed length data called a TS packet, and also all these information is multiplexed. While the digital broadcasting receiver gained PSI first and having received extraction and its information for an image, packet ID (PID) of an audio stream, etc., to always catch this and to update it is needed. PSI and SI are based on the section form specified by an MPEG 2 system. The field (5 bits) called a version number is established in this section for management of renewal of data. Although it will depend on broadcast service for the method of employing a version number, it *****s a version number by usually updating information in many cases. Therefore, a digital broadcasting receiver will wait for information with the value which *****ed the one version number, after receiving a certain PSI.

0003 In order to take out only a desired TS packet from multiplexed MPEG 2-TS, DEMUX (demultiplexer) is provided in a receiving set. DEMUX specifies PID and several bytes of bit pattern following it, compares this with an input stream in an internal decision circuit, when in agreement with the specified pattern, writes out the packet to a predetermined memory, and has the function to tell a host CPU etc. about arrival of data.

0004

Problem(s) to be Solved by the Invention It becomes a problem when it is transmitted by a different pattern from the bit pattern which should be sent essentially, although the information which it is satisfactory when transmission and reception are performed normally as for the conventional system, but wants for send trouble, radio disturbance, etc. to occur **information** and to receive them is not a grammatical and semantic error. In this case, since the receiver cannot detect the pattern and match which were specified, it may be in the waiting state on several for a long time depending on the case. In particular, the discontinuity of a version number poses a problem.

0005 This problem is explained in more detail with reference to drawing 7 (a). Now, the TS packet of version number =1 is gained and suppose that it is an acquisition preparatory state of the TS packet of version number =2. If it is program information etc., a version number will be updated like 1 time on 1, for example. However, since there is no telling when start reception in a receiver,

this kind of TS packet is repeatedly resent at an interval with a constant thing of an identical content. DEMUX of a receiving set performs pattern matching with the specific matching field containing packet ID and a version number, and the packet of waiting and version number =1 disregards the packet of packet ID=80 and version number =2 in this example. If communication failure etc. occur here, the change of MUX (multiplexer) of the transmitting side, etc. will occur, for example, a version number will be set to 4, and the continuity of a version number will be lost. In this case, since it is waiting for version number =2 in the receiver, it becomes impossible to gain the updated packet and will be in a prolonged waiting state.

0006In order to avoid such a problem, how to disregard a version number and catch data is also considered, but since information, including PSI etc., is resent frequently, a host CPU must judge whether it is update information at every time, and it is inefficient. When a host CPU checks a data capture situation periodically and is judged to be unusual as another evasion measure, it is possible to perform re-acquisition processing of PSI, but it is difficult to judge abnormalities correctly and cannot be said to be fundamental solution.

0007This invention was made in view of such a problem, and an object of an invention is to provide the receiving set of the transport stream which can realize dogged TS demux processing also to send trouble or radio disturbance.

0008

Means for Solving the ProblemA receiving set of a transport stream which requires this invention for this invention, A packet of a request including the 2nd information changed whenever the contents of the 1st information that specifies that it is a packet which should be gained from a multiplexed transport stream, and the packet concerned are changed, A receiving set of a transport stream gained whenever said 2nd information is changed is characterized by comprising:

The 1st filter that detects said 1st information from said inputted transport stream, and extracts a packet of said request.

The 2nd filter that extracts a packet extracted with said 1st filter when it detected that said 2nd information included in a packet extracted with this 1st filter differs from the 2nd information under present surveillance.

A control means which updates the 2nd information that the packet concerned is gained when a desired packet is extracted by this 2nd filter, and is supervised next to the 2nd newly detected information.

0009A packet of said request is data by which repeating transmission is carried out by an identical content here, while said 2nd information is changed. The 1st filter shall extract the packet concerned, when coincidence with the specific matching field and the 1st pattern of said packet which should be gained is detected, for example. The 2nd filter shall extract the packet concerned, when disagreement of the specific matching field and the 2nd pattern of said packet which should be gained is detected.

0010It does not supervise that it is in agreement with the 2nd information on a packet after updating which should be gained next as the 2nd information updated whenever the contents of the packet are updated according to this invention, Since he is trying to supervise becoming the 2nd present information and disagreement of a packet, even when not being updated by a fault occurrence by order that the 2nd information was decided, renewal of a packet can be detected by **with the 2nd present information** becoming inharmonious.

0011Even when a control means gained a desired packet periodically irrespective of renewal of the 2nd information and the 2nd same information as last time is received by chance at the time of a fault occurrence, a prolonged waiting state can be avoided in a certain limit.

0012

Embodiment of the InventionHereafter, the desirable embodiment of this invention is described with reference to drawings. Drawing 1 is a block diagram showing the composition of the receiving set of the CS digital broadcast concerning one example of this invention. Recovery processing is carried out with the tuner 2, and error correction processing of the CS input signal received via the antenna 1 is carried out in the error correction part 3. The data by which the error correction was carried out has scramble solved by the descrambler 4, and is supplied to the demultiplexer (DEMUX) 5. DEMUX5 is what takes out only required information out of the multiplexed information, Control information, program related information, etc. are supplied to CPU8 via the

data buffer 6 and the system bath 7, about a video data and audio information, are supplied to the MPEG-A/V decoder 9 and decoded. About the decoded video data, further, by the video encoder 10, it is encoded by the NTSC video signal and outputted to it. To the system bath 7, memorize the operation program of switch / remote control input part 12, and CPU8, or, **which receives the infrared signal from the remote control 11 besides CPU8** The modem 15 for transmitting and receiving data to the conditional access module 14 and telephone network which obtain the key for carrying out RAM/ROM13 which provides a work area, and descrambling processing is connected.

0013 Drawing 2 is a functional block diagram showing the still more detailed composition of DEMUX5 in the above-mentioned system. Only flowing into control information, program related information, etc. is shown especially here, and the flow of a video data or audio information is omitted. This DEMUX5 is provided with the TS packet framer 21, a PID filter, the unit start primary detecting element 23, the pattern match filter 24, and the pattern AMMATCHI filter 25, and it is constituted.

0014 The example of a typical MPEG 2-TS packet and the section constituted by this is shown in drawing 3. As shown in the figure (a), a TS packet is 188 bytes of fixed length packet which comprises 4 bytes of a header, and 184 bytes of a data byte. Information, including a synchronous byte (8 bits), a pay-load unit start (1 bit), PID (13 bits), etc., is included in the header. In the TS packet framer 21 inside DEMUX5, processing which starts the TS packet of 188 byte fixed length with reference to a synchronous byte etc. is performed. The PID information shown in TS header of the TS packet started by this TS packet framer 21 is checked with PID filter 22, and the packet which is in agreement with PID directed from CPU8 is started. From the started TS packet, the data byte part which the data byte part was taken out and taken out from two or more TS packets is combined, and the data block of the section form defined by the MPEG 2 system as shown in drawing 3 (b) is formed. When forming a section, 1-bit payload_unit_start_indicator which shows whether the section header is contained in the data byte of the packet as information which shows which TS packet becomes the head is prepared. The unit start primary detecting element 23 supervises this information, and detects leading packets.

0015 Drawing 3 (c) is a figure showing the example of a bit array of the formed section. A section header is provided in the head of a section. In this example, a section header comprises 8 bytes, for example, includes the following information.

**** table_id** (8 bits)

Identification information ****section_length** of a table (12 bits)

When you would like to extend length ****table_id_extention**table_id of a section. An ID number in case the information ****section_number** table for judging the existence of renewal of the field

****version_number** table information boiled and used comprises two or more sections

**** last_section_number** : the ID number of the section of the last in case a table comprises two or more sections

0016 This section header is compared with the matching pattern given from CPU8 in the pattern match filter 24. The mask pattern is also given to the pattern match filter 24 from CPU8, and conducts matching is performed after carrying out the mask of the bit unrelated to pattern matching of a section header with this mask pattern. As the 1st information for specifying here the TS packet which should be gained, For example table_id=23h and table_id_extention=0456h Waiting, It is version_number as the 2nd information changed whenever the contents of the packet are changed! Supposing it is setting out which waits for the information on =1 (except 1), He takes up the whole of the 1st and 2nd information of the above using a mask pattern like drawing 3 (e), and was trying to detect the renewal of contents of a TS packet by detecting coincidence with the above-mentioned pattern in the conventional pattern matching.

0017 On the other hand, in this invention, the renewal of contents of a TS packet is detected using two filters called the pattern match filter (the 1st filter) 24 and the pattern AMMATCHI filter (the 2nd filter) 25. First, in the pattern match filter 24, a mask pattern like drawing 4 (c) is used, only the portion of table_id and table_id_extention which are the 1st information is taken up, and the mask of the other portions is carried out. And as shown in the figure (b), pattern matching with table_id=23h for which it is waiting now, and table_id_extention=0456h is performed, and the packet is extracted when in agreement.

0018 Next, in the pattern AMMATCHI filter 25, a mask pattern like drawing 4 (e) is used, only the portion of version_number which is the 2nd information is taken up, and the mask of the other

portions is carried out. And version_number for which it is waiting now as shown in the figure (d)! When disagreement is detected as a result of PATANAN conducts matching called =1, The packet is written in the data buffer (queue buffer memory) 6 connected to DEMUX5, and it is reported that desired data arrived to CPU8 in the place which the section completed.

0019According to this device, in like and the state where the TS packet of version_number=1 is gained which are shown in drawing 7 (b). Also by a case as an obstacle occurs in a communication line etc. and it was set to version_number=4, it is version_number! This TS packet can be gained on the conditions of =1 (except 1).

0020After a fault occurrence, when data comes by the version number same by chance, the above-mentioned device cannot detect this, either. Then, CPU8 performs processing which incorporates data periodically and it may be made to judge whether it is new data by comparing the contents of data with pre-acquisition data after data capture irrespective of a version number. This processing is equivalent to resetting data capture processing periodically.

0021Drawing 5 and drawing 6 are the flow charts for explaining this processing. As shown in drawing 5, whenever the data notification of arrival (Arrival Notice) from DEMUX5 is usually detected in a process, Data (version_number=x) is read from the data buffer 6 (S1), and acquisition setting out of the following data (version_number !=x) is performed (S2). And an acquisition supervisory timer is reset (S3). On the other hand, the acquisition monitoring process shown in drawing 6 is usually performed in the background of a treatment process. That is, if count-up (S11) of a timer and the unit time waiting (S13) of a timer are repeated and an acquisition reset time is reached until it reaches an acquisition reset time (S12), the waiting for the present data will be canceled, and acquisition setting out of the data which disregarded the version is performed (S14). And an acquisition supervisory timer is reset (S15). Thus, if it goes through acquisition monitor time even when the same version number is received by chance after a fault occurrence by applying interruption by fixed time, it will return to an all seems well. If this acquisition monitor time is not much short, its burden of CPU8 will increase, when not much long, waiting time until it returns to an all seems well at the time of an abnormal occurrence will increase, but. Since it is thought that the probability that it will happen simultaneously becoming the same version number as a fault occurrence is very small, about 1 time is enough in several hours.

0022

Effect of the InventionIt does not supervise that it is in agreement with the 2nd information on the packet after updating which should be gained next as the 2nd information updated whenever the contents of the packet are updated according to this invention as stated above, Since he is trying to supervise becoming the 2nd present information and disagreement of a packet, Even when not updated by a fault occurrence by the order that the 2nd information was decided, by **with the 2nd present information** becoming inharmonious, renewal of a packet can be detected and the adaptability to a fault occurrence can be raised.

Field of the InventionThis invention, for example like MPEG 2(Moving Picture Experts Group Phase 2)-TS (Transport Stream), It is related with the receiving set of the transport stream which improved especially the adaptability at the time of a fault occurrence about the receiving set which gains a desired packet from the multiplexed transport stream.

Description of the Prior ArtIn digital data broadcast, as a multiplexed transmission stream, an image and a sound are digitized with the gestalt of MPEG 2-TS and it is sent to a receiver at digital CS broadcasting, for example. At this time, the program related information called program specification information (ProgramSpecific Information:PSI) and servicing information (Service Information:SI) is also simultaneously sent to TS. It was packet-ized by 188 bytes of fixed length data called a TS packet, and also all these information is multiplexed. While the digital broadcasting receiver gained PSI first and having received extraction and its information for an image, packet ID (PID) of an audio stream, etc., to always catch this and to update it is needed.

PSI and SI are based on the section form specified by an MPEG 2 system. The field (5 bits) called a version number is established in this section for management of renewal of data. Although it will depend on broadcast service for the method of employing a version number, it *****s a version number by usually updating information in many cases. Therefore, a digital broadcasting receiver will wait for information with the value which *****ed the one version number, after receiving a certain PSI.

0003In order to take out only a desired TS packet from multiplexed MPEG 2-TS, DEMUX (demultiplexer) is provided in a receiving set. DEMUX specifies PID and several bytes of bit pattern following it, compares this with an input stream in an internal decision circuit, when in agreement with the specified pattern, writes out the packet to a predetermined memory, and has the function to tell a host CPU etc. about arrival of data.

Effect of the InventionIt does not supervise that it is in agreement with the 2nd information on the packet after updating which should be gained next as the 2nd information updated whenever the contents of the packet are updated according to this invention as stated above, Since he is trying to supervise becoming the 2nd present information and disagreement of a packet, Even when not updated by a fault occurrence by the order that the 2nd information was decided, by **with the 2nd present information** becoming inharmonious, renewal of a packet can be detected and the adaptability to a fault occurrence can be raised.

Problem(s) to be Solved by the InventionIt becomes a problem when it is transmitted by a different pattern from the bit pattern which should be sent essentially, although the information which it is satisfactory when transmission and reception are performed normally as for the conventional system, but wants for send trouble, radio disturbance, etc. to occur **information** and to receive them is not a grammatical and semantic error. In this case, since the receiver cannot detect the pattern and match which were specified, it may be in the waiting state on several for a long time depending on the case. In particular, the discontinuity of a version number poses a problem.

0005This problem is explained in more detail with reference to drawing 7 (a). Now, the TS packet of version number =1 is gained and suppose that it is an acquisition preparatory state of the TS packet of version number =2. If it is program information etc., a version number will be updated like 1 time on 1, for example. However, since there is no telling when start reception in a receiver, this kind of TS packet is repeatedly resent at an interval with a constant thing of an identical content. DEMUX of a receiving set performs pattern matching with the specific matching field containing packet ID and a version number, and the packet of waiting and version number =1 disregards the packet of packet ID=80 and version number =2 in this example. If communication failure etc. occur here, the change of MUX (multiplexer) of the transmitting side, etc. will occur, for example, a version number will be set to 4, and the continuity of a version number will be lost. In this case, since it is waiting for version number =2 in the receiver, it becomes impossible to gain the updated packet and will be in a prolonged waiting state.

0006In order to avoid such a problem, how to disregard a version number and catch data is also considered, but since information, including PSI etc., is resent frequently, a host CPU must judge whether it is update information at every time, and it is inefficient. When a host CPU checks a data capture situation periodically and is judged to be unusual as another evasion measure, it is possible to perform re-acquisition processing of PSI, but it is difficult to judge abnormalities correctly and cannot be said to be fundamental solution.

0007This invention was made in view of such a problem, and an object of an invention is to provide the receiving set of the transport stream which can realize dogged TS demux processing also to send trouble or radio disturbance.

Means for Solving the Problem A receiving set of a transport stream which requires this invention for this invention, A packet of a request including the 2nd information changed whenever the contents of the 1st information that specifies that it is a packet which should be gained from a multiplexed transport stream, and the packet concerned are changed, A receiving set of a transport stream gained whenever said 2nd information is changed is characterized by comprising:

The 1st filter that detects said 1st information from said inputted transport stream, and extracts a packet of said request.

The 2nd filter that extracts a packet extracted with said 1st filter when it detected that said 2nd information included in a packet extracted with this 1st filter differs from the 2nd information under present surveillance.

A control means which updates the 2nd information that the packet concerned is gained when a desired packet is extracted by this 2nd filter, and is supervised next to the 2nd newly detected information.

0009 A packet of said request is data by which repeating transmission is carried out by an identical content here, while said 2nd information is changed. The 1st filter shall extract the packet concerned, when coincidence with the specific matching field and the 1st pattern of said packet which should be gained is detected, for example. The 2nd filter shall extract the packet concerned, when disagreement of the specific matching field and the 2nd pattern of said packet which should be gained is detected.

0010 It does not supervise that it is in agreement with the 2nd information on a packet after updating which should be gained next as the 2nd information updated whenever the contents of the packet are updated according to this invention, Since he is trying to supervise becoming the 2nd present information and disagreement of a packet, even when not being updated by a fault occurrence by order that the 2nd information was decided, renewal of a packet can be detected by **with the 2nd present information** becoming inharmonious.

0011 Even when a control means gained a desired packet periodically irrespective of renewal of the 2nd information and the 2nd same information as last time is received by chance at the time of a fault occurrence, a prolonged waiting state can be avoided in a certain limit.

0012

Embodiment of the Invention Hereafter, the desirable embodiment of this invention is described with reference to drawings. Drawing 1 is a block diagram showing the composition of the receiving set of the CS digital broadcast concerning one example of this invention. Recovery processing is carried out with the tuner 2, and error correction processing of the CS input signal received via the antenna 1 is carried out in the error correction part 3. The data by which the error correction was carried out has scramble solved by the descrambler 4, and is supplied to the demultiplexer (DEMUX) 5. DEMUX5 is what takes out only required information out of the multiplexed information, Control information, program related information, etc. are supplied to CPU8 via the data buffer 6 and the system bath 7, about a video data and audio information, are supplied to the MPEG-A/V decoder 9 and decoded. About the decoded video data, further, by the video encoder 10, it is encoded by the NTSC video signal and outputted to it. To the system bath 7, memorize the operation program of switch / remote control input part 12, and CPU8, or, **which receives the infrared signal from the remote control 11 besides CPU8** The modem 15 for transmitting and receiving data to the conditional access module 14 and telephone network which obtain the key for carrying out RAM/ROM13 which provides a work area, and descrambling processing is connected.

0013 Drawing 2 is a functional block diagram showing the still more detailed composition of DEMUX5 in the above-mentioned system. Only flowing into control information, program related information, etc. is shown especially here, and the flow of a video data or audio information is omitted. This DEMUX5 is provided with the TS packet framer 21, a PID filter, the unit start primary detecting element 23, the pattern match filter 24, and the pattern AMMATCHI filter 25, and it is constituted.

0014 The example of a typical MPEG 2-TS packet and the section constituted by this is shown in drawing 3. As shown in the figure (a), a TS packet is 188 bytes of fixed length packet which comprises 4 bytes of a header, and 184 bytes of a data byte. Information, including a synchronous byte (8 bits), a pay-load unit start (1 bit), PID (13 bits), etc., is included in the header. In the TS packet framer 21 inside DEMUX5, processing which starts the TS packet of 188 byte fixed length

with reference to a synchronous byte etc. is performed. The PID information shown in TS header of the TS packet started by this TS packet framer 21 is checked with PID filter 22, and the packet which is in agreement with PID directed from CPU8 is started. From the started TS packet, the data byte part which the data byte part was taken out and taken out from two or more TS packets is combined, and the data block of the section form defined by the MPEG 2 system as shown in drawing 3 (b) is formed. When forming a section, 1-bit payload_unit_start_indicator which shows whether the section header is contained in the data byte of the packet as information which shows which TS packet becomes the head is prepared. The unit start primary detecting element 23 supervises this information, and detects leading packets.

0015 Drawing 3 (c) is a figure showing the example of a bit array of the formed section. A section header is provided in the head of a section. In this example, a section header comprises 8 bytes, for example, includes the following information.

**** table_id** (8 bits)

Identification information ****section_length** of a table (12 bits)

When you would like to extend length ****table_id_extention**table_id of a section. An ID number in case the information ****section_number** table for judging the existence of renewal of the field

****version_number** table information boiled and used comprises two or more sections

**** last_section_number** : the ID number of the section of the last in case a table comprises two or more sections

0016 This section header is compared with the matching pattern given from CPU8 in the pattern match filter 24. The mask pattern is also given to the pattern match filter 24 from CPU8, and conducts matching is performed after carrying out the mask of the bit unrelated to pattern matching of a section header with this mask pattern. As the 1st information for specifying here the TS packet which should be gained, For example table_id=23h and table_id_extention=0456h Waiting, It is version_number as the 2nd information changed whenever the contents of the packet are changed! Supposing it is setting out which waits for the information on =1 (except 1), He takes up the whole of the 1st and 2nd information of the above using a mask pattern like drawing 3 (e), and was trying to detect the renewal of contents of a TS packet by detecting coincidence with the above-mentioned pattern in the conventional pattern matching.

0017 On the other hand, in this invention, the renewal of contents of a TS packet is detected using two filters called the pattern match filter (the 1st filter) 24 and the pattern AMMATCHI filter (the 2nd filter) 25. First, in the pattern match filter 24, a mask pattern like drawing 4 (c) is used, only the portion of table_id and table_id_extention which are the 1st information is taken up, and the mask of the other portions is carried out. And as shown in the figure (b), pattern matching with table_id=23h for which it is waiting now, and table_id_extention=0456h is performed, and the packet is extracted when in agreement.

0018 Next, in the pattern AMMATCHI filter 25, a mask pattern like drawing 4 (e) is used, only the portion of version_number which is the 2nd information is taken up, and the mask of the other portions is carried out. And version_number for which it is waiting now as shown in the figure (d)! When disagreement is detected as a result of PATANAN conducts matching called =1, The packet is written in the data buffer (queue buffer memory) 6 connected to DEMUX5, and it is reported that desired data arrived to CPU8 in the place which the section completed.

0019 According to this device, in like and the state where the TS packet of version_number=1 is gained which are shown in drawing 7 (b). Also by a case as an obstacle occurs in a communication line etc. and it was set to version_number=4, it is version_number! This TS packet can be gained on the conditions of =1 (except 1).

0020 After a fault occurrence, when data comes by the version number same by chance, the above-mentioned device cannot detect this, either. Then, CPU8 performs processing which incorporates data periodically and it may be made to judge whether it is new data by comparing the contents of data with pre-acquisition data after data capture irrespective of a version number. This processing is equivalent to resetting data capture processing periodically.

0021 Drawing 5 and drawing 6 are the flow charts for explaining this processing. As shown in drawing 5, whenever the data notification of arrival (Arrival Notice) from DEMUX5 is usually detected in a process, Data (version_number=x) is read from the data buffer 6 (S1), and acquisition setting out of the following data (version_number !=x) is performed (S2). And an acquisition supervisory timer is reset (S3). On the other hand, the acquisition monitoring process

shown in drawing 6 is usually performed in the background of a treatment process. That is, if count-up (S11) of a timer and the unit time waiting (S13) of a timer are repeated and an acquisition reset time is reached until it reaches an acquisition reset time (S12), the waiting for the present data will be canceled, and acquisition setting out of the data which disregarded the version is performed (S14). And an acquisition supervisory timer is reset (S15). Thus, if it goes through acquisition monitor time even when the same version number is received by chance after a fault occurrence by applying interruption by fixed time, it will return to an all seems well. If this acquisition monitor time is not much short, its burden of CPU8 will increase, when not much long, waiting time until it returns to an all seems well at the time of an abnormal occurrence will increase, but. Since it is thought that the probability that it will happen simultaneously becoming the same version number as a fault occurrence is very small, about 1 time is enough in several hours.

Brief Description of the Drawings

Drawing 1 It is a block diagram of CS receiving set concerning one example of this invention.

Drawing 2 It is a functional block diagram of DEMUX of the device.

Drawing 3 It is a figure showing the structure of the MPEG 2-TS packet received with the device, and a section.

Drawing 4 It is a figure for explaining the pattern matching processing and PATANAN conducts matching in the device.

Drawing 5 It is the flow chart which improved the device further and which usually shows a treatment process.

Drawing 6 It is a flow chart which similarly shows a data capture supervisory process.

Drawing 7 It is a figure showing an operation and effect of this invention as compared with a conventional example.

Description of Notations

5 -- A unit start primary detecting element, 24 / -- A pattern match filter, 25 / -- Pattern AMMATCHI filter. -- DEMUX, 21 -- A TS packet framer, 22 -- A PID filter, 23

Drawing 1

For drawings please refer to the original document.

Drawing 2

For drawings please refer to the original document.

Drawing 4

For drawings please refer to the original document.

Drawing 3

For drawings please refer to the original document.

Drawing 5

For drawings please refer to the original document.

Drawing 6

For drawings please refer to the original document.

Drawing 7

For drawings please refer to the original document.

For drawings please refer to the original document.
